

CLAIMS

1. A method for collating items into at least one ordered group from at least two subgroups using a processor, modules for supplying items and a mechanism for transporting items to an output destination, said method comprising:

- 5 (a) arranging the at least two subgroups such that items are in order within each of the at least two subgroups;
- (b) placing each of the at least two subgroups into corresponding modules for supplying the items;
- (c) controlling a module for a subgroup containing an item of a first ordered group
- 10 to be supplied to supply the item at a given time to the mechanism for transporting;
- (d) repeating act (c) until all items of the first ordered group are collated;
- (e) checking the order of the items as they are transported to the output destination; and
- (f) performing error-correcting routines if an error is detected.

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2. The method of claim 1, further comprising:

- (h) repeating steps (c)-(f) for each remaining group of the at least one ordered group.

20 3. The method of claim 1, wherein act (a) further comprises subdividing the at least one ordered group into the at least two subgroups such that the items in the at least two subgroup remain ordered relative to the order of the at least one ordered group.

25 4. The method of claim 3, wherein subdividing the at least one ordered group into the at least two subgroups comprises choosing a subgroup of the at least two subgroups for each item based upon rules, which rules are unrelated to the order of the items in the at least one ordered group.

30 5. The method of claim 3, wherein each item bears indicia identifying the position of the item in the at least one ordered group.

6. The method of claim 5, wherein the indicia is a bar code.

7. The method of claim 5, wherein act (e) further comprises checking the indicia on each item.
8. The method of claim 5 further comprising notifying the processor when an out of 5 order item is detected.
9. The method of claim 8, wherein act (f) further comprises inserting a placeholder when a missing item is detected.
10. 10. The method of claim 9, further comprising placing indicia on the placeholder identifying the position of the missing item in the at least one ordered group.
11. The method of claim 10, wherein the placeholder indicia is printed when the error is detected.
- 15 12. The method of claim 10, wherein the placeholder is a card, and wherein at least one physical attribute of the card differs from a corresponding physical attribute of the items.
- 20 13. The method of claim 8, wherein act (f) further comprises sending out-of-order items to at least one separate location.
14. The method of claim 1, wherein the items are received at the output destination from a stream of items carried by a conveyor.
- 25 15. The method of claim 14, wherein the items are stacked into at least one bin at the output destination.
- 30 16. The method of claim 15, wherein the items are subdivided into the at least one bin based on their order in the at least one ordered group.
17. The method of claim 1, wherein the at least two modules are positioned linearly along the mechanism for transporting the items, wherein said mechanism for transporting

moves items at a selected speed, and wherein act (c) further comprises utilizing knowledge of a position of the items and the position of the modules to determine the module supplying the next item.

5 18. The method of claim 17, wherein the act of utilizing knowledge of the position of the items further comprises determining the position of the items using at least one presence detection device.

10 19. The method of claim 17, wherein the act of utilizing knowledge of the position of the items further comprises determining the position of the items using knowledge of the selected speed of the mechanism for transporting.

20. An apparatus for collating items into at least one ordered group from at least two subgroups, said apparatus comprising:

15 a mechanism for transporting the items to an output destination;
 at least two modules containing corresponding subgroups for supplying items to the mechanism for transporting the items in response to supply instructions;
 a processor for determining the at least one item to be supplied at a given time and generating instructions for a said module to supply the at least one item;
20 a mechanism for checking the order of items as they are transported to the output destination; and
 a mechanism for correcting an error detected in the order of items as they are transported to the output destination.

25 21. The apparatus of claim 20, wherein each item bears indicia identifying the position of the item in the at least one ordered group, and wherein the mechanism for checking the order of the items includes a mechanism checking the indicia on each item.

30 22. The apparatus of claim 21, wherein the indicia is a bar code, and wherein the mechanism checking the indicia is a bar code reader.

23. The apparatus of claim 20, wherein the mechanism for checking the order of the items is adapted to notify the processor when an out of order item is detected.

24. The apparatus of claim 23, wherein the mechanism for correcting the error inserts a placeholder if a missing item is detected.

5 25. The apparatus of claim 24, wherein the mechanism for correcting the error places indicia on the placeholder identifying the position of the missing item in the at least one ordered group.

10 26. The apparatus of claim 24, wherein the placeholder is a card, and wherein at least one physical attributes of the card differs from a corresponding physical attribute of the items.

27. The apparatus of claim 23, wherein the mechanism for correcting an error sends the out of order item to at least one separate location.

15 28. The apparatus of claim 20, wherein the items are received at the output destination from a stream of items carried by a conveyor.

20 29. The apparatus of claim 28, further comprising at least one bin in which the items are stacked at the output destination.

30. The apparatus of claim 29, wherein the items are stacked into the at least one bin based on their order in the at least one ordered group.

25 31. The apparatus of claim 20, wherein the at least two modules are positioned linearly along the mechanism for transporting the items, wherein said mechanism for transporting moves items at a selected speed, and wherein the processor utilizes knowledge of the position the items and relative position of the modules in determining the at least one item to be supplied by the said module at the given time.

30 32. The apparatus of claim 31, further comprising a plurality of presence detection devices for determining the position of the items.

33. The apparatus of claim 31, wherein the processor determines the position of the items based upon the selected speed of the conveyor.
34. A method for correcting errors in an apparatus for collating items into an ordered group from at least two subgroups using at least one module for supplying the items and a mechanism for transporting the items to an output destination, wherein each item bears indicia identifying the position of the item in the ordered group, said method comprising:
5 checking the order of the items as they are transported to the output destination by checking the indicia on each item;
10 inserting a placeholder when a missing item is detected; and
 diverting an out-of-order item to a separate location when an out-of-order item is detected.
35. The method of claim 34, further comprising placing indicia on the placeholder
15 identifying the position of the missing item in the ordered group.
36. The method of claim 35, wherein the placeholder is a card, and wherein at least one physical attribute of said card differs from a corresponding physical attribute of the items.
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37. An apparatus for correcting errors in an ordered group of items bearing indicia of their position in the ordered group, said apparatus comprising:
 a mechanism for transporting the items one by one;
 a mechanism for checking the order of the items as they are transported on the
25 mechanism for transporting the items by checking the indicia on the items;
 a mechanism for inserting a placeholder when a missing item is detected; and
 a mechanism for routing an out-of-order item to a separate location when an out-of-order item is detected.
- 30 38. The apparatus of claim 37, further comprising a mechanism for placing indicia on the placeholder identifying the position of the missing item in the ordered group.

39. The apparatus of claim 38, wherein the placeholder is a card, and wherein at least one physical attribute of said card differs from a corresponding physical attribute of the items.